PEPWAVE

Broadband Possibilities

User Manual

Pepwave CarFi Series:
CarFi 200, E200, 400

November 09

COPYRIGHT & TRADEMARKS
Specifications are subject to change without notice. Copyright © 2009 Pepwave Ltd. All Rights Reserved. Pepwave and the Pepwave logo are trademarks of Pepwave Ltd. Other brands or products mentioned may be trademarks or registered trademarks of their respective owners.

Table of Contents

1 COPYRIGHT 3

2 DISCLAIMER 3

3 PRODUCT DESCRIPTION 4

3.1 PRODUCT FEATURES 4
3.2 HARDWARE SETUP 4
3.3 LED DESCRIPTION 5

4 USING THE PEPWAVE DEVICES 6

4.1 PRE-CONFIGURING PC SETUP 6
4.2 FIRST TIME SETUP 7
4.3 SETTINGS DETAILS 11
4.4 INTEGRATED WI-FI ACCESS POINT CONFIGURATION 16
4.5 TEST THE SETUP 19
4.6 PORT FORWARDING 20
4.7 QOS 22
4.8 FIRMWARE UPGRADE 23
4.9 DEBUG AND SYSTEM INFORMATION 24
4.10 RESTORE TO DEFAULT SETTINGS 25

APPENDIX: 26

FEDERAL COMMUNICATION COMMISSION INTERFERENCE STATEMENT 26

 Copyright © 2009 Pepwave

1 Copyright

Copyright © 2009 by Pepwave Ltd.

The content of this documentation may not be reproduced in any part or as a whole without the prior written permission of Pepwave Ltd.

2 Disclaimer

Pepwave does not assume any liability arising out of the application or use of any products, or software described herein. Neither does it convey any license under its patent right nor the patent rights of others. Pepwave further reserves the right to make changes in any products described herein without notice. This documentation is subject to change without notice.

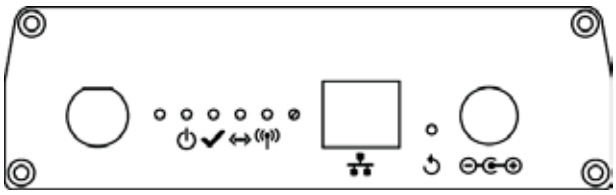
3 Product Description

3.1 Product Features

- Roaming support
- WPA/WPA2-Personal and WPA/WPA2-Enterprise security support
- Built-in DHCP server and NAT routing to manage client devices
- Wi-Fi Multimedia (WMM) support
- Easy-to-access web-based configuration

CarFi 200, E200, 400

3.2 Hardware Setup



1. Attach the antenna provided to the left most antenna connector
2. Connect the LAN port to the computer Ethernet port with an Ethernet cable.
3. Connect the end of the included power adapter to the power socket on the Pepwave CarFi device.
4. Power on the power adaptor.

 Copyright © 2009 Pepwave

3.3 LED Description

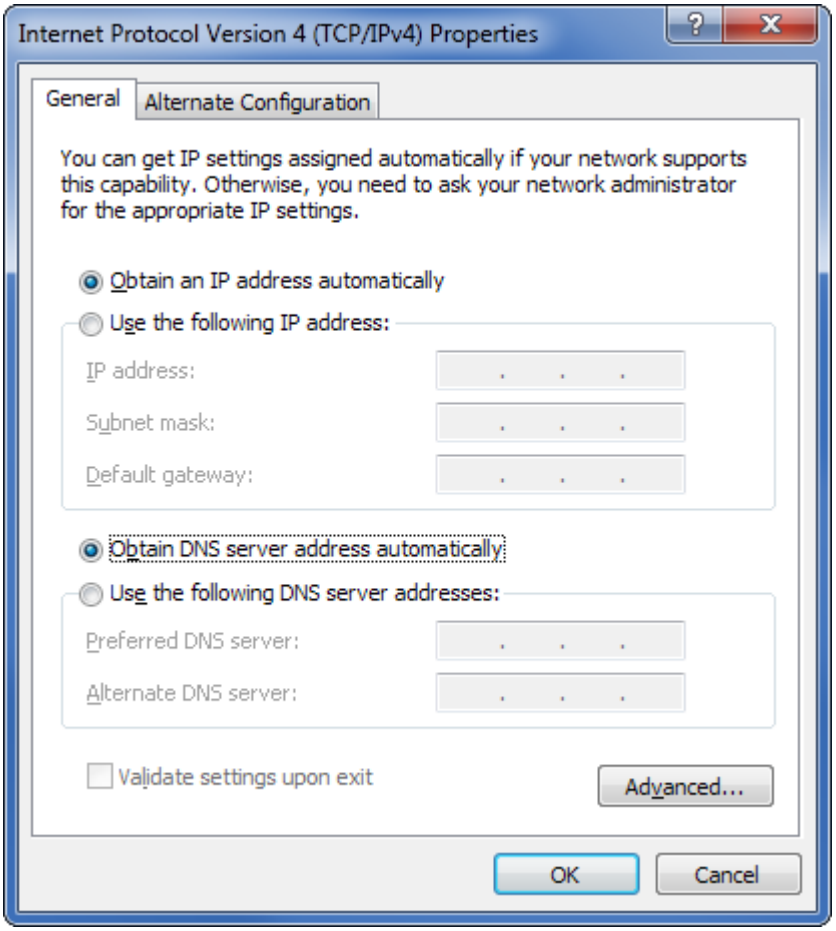
LED	Color	Status	Description
Power	Green	On	Power is on
		Off	Power is off
Status	Green	Solid	Received signal is Excellent, Very Good and Good
		Off	Booting up / Upgrading firmware
LAN	Green	On	Ethernet is connected
		Off	Ethernet is not connected
Wi-Fi	Green	N/A	Associated with an access point
		Off	Not associated with any access point

 Copyright © 2009 Pepwave

4 Using the Pepwave Devices

4.1 Pre-configuring PC Setup

You should set up your computer's LAN interface to obtain an IP address automatically. In order to do so, select the *Start* menu, *Control Panel* and then *Network Connections*. Right click on the **Local Area Connection** icon, choose *Properties*, double-click on the item **Internet Protocol (TCP/IP)** from the list. On the screen, just set it as follows:


Internet Protocol Version 4 (TCP/IPv4) Properties
General
Alternate Configuration
You can get IP settings assigned automatically if your network supports this capability. Otherwise, you need to ask your network administrator for the appropriate IP settings.
Obtain an IP address automatically
Use the following IP address:
IP address:
Subnet mask:
Default gateway:
Obtain DNS server address automatically
Use the following DNS server addresses:
Preferred DNS server:
Alternate DNS server:
Validate settings upon exit
Advanced...
OK
Cancel

Click the **OK** button to confirm the change.

 Copyright © 2009 Pepwave

4.2 First Time Setup

On your PC, start a web browser, e.g. Internet Explorer, Mozilla Firefox, etc. Visit an Internet web site. If you are not associated to an access point, you should be redirected to a logon page. Or you can go also go to this URL:

http://192.168.20.1/

The welcome page of Pepwave CarFi will look like the illustration below.

Pepwave CarFi
Please click the Advanced Config button for configuration and then click the Connect button to establish wireless Internet connection
Advanced Config
Connect!
CarFi 200 / 9.0.27

Illustration 1: Welcome Page

 Copyright © 2009 Pepwave

Click the **Advanced Config** button to enter the parameters of the access point to associate to. You should see this screen:

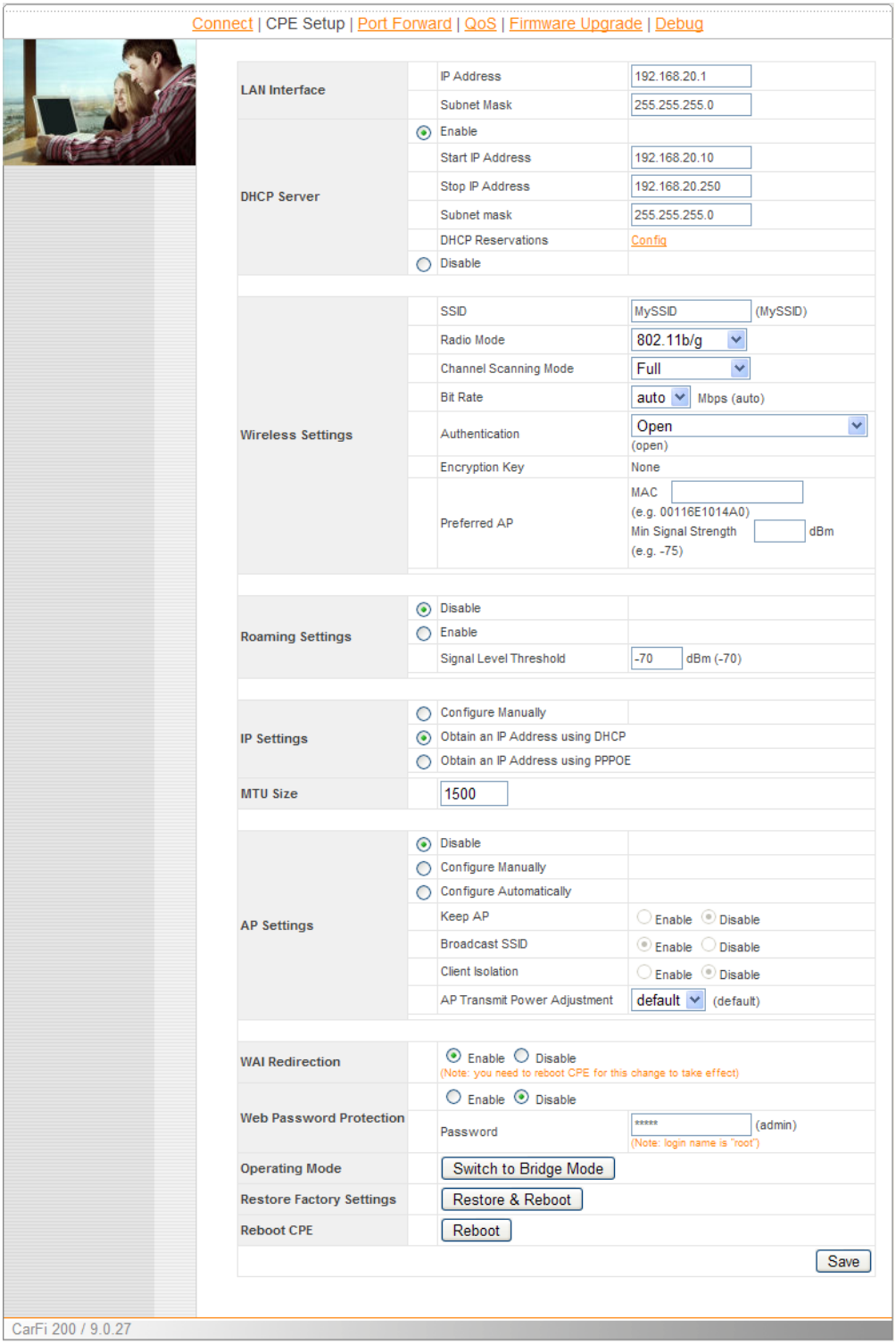


Illustration 2: Pepwave CarFi Setup Page

 Copyright © 2009 Pepwave

In the field **SSID** under *Wireless* Settings, input the access point's SSID (sometimes it is called the "*network name*"). According to the setting of the Access Point you are associating to, you may choose a different Authentication setting.

If *Static WEP key* or *WPA/WPA2-Personal* is selected for **Authentication**, input the Encryption Key field as well. (There are also options of *802.1x with dynamic WEP key* and *WPA/WPA2-Enterprise*. You do not need to use these settings unless instructed to do so by your ISP.)

Click the **Save** button at the bottom to complete.

You can now click the *Connect* link on the top bar and then click the **Connect** button to associate with the access point.

 Copyright © 2009 Pepwave

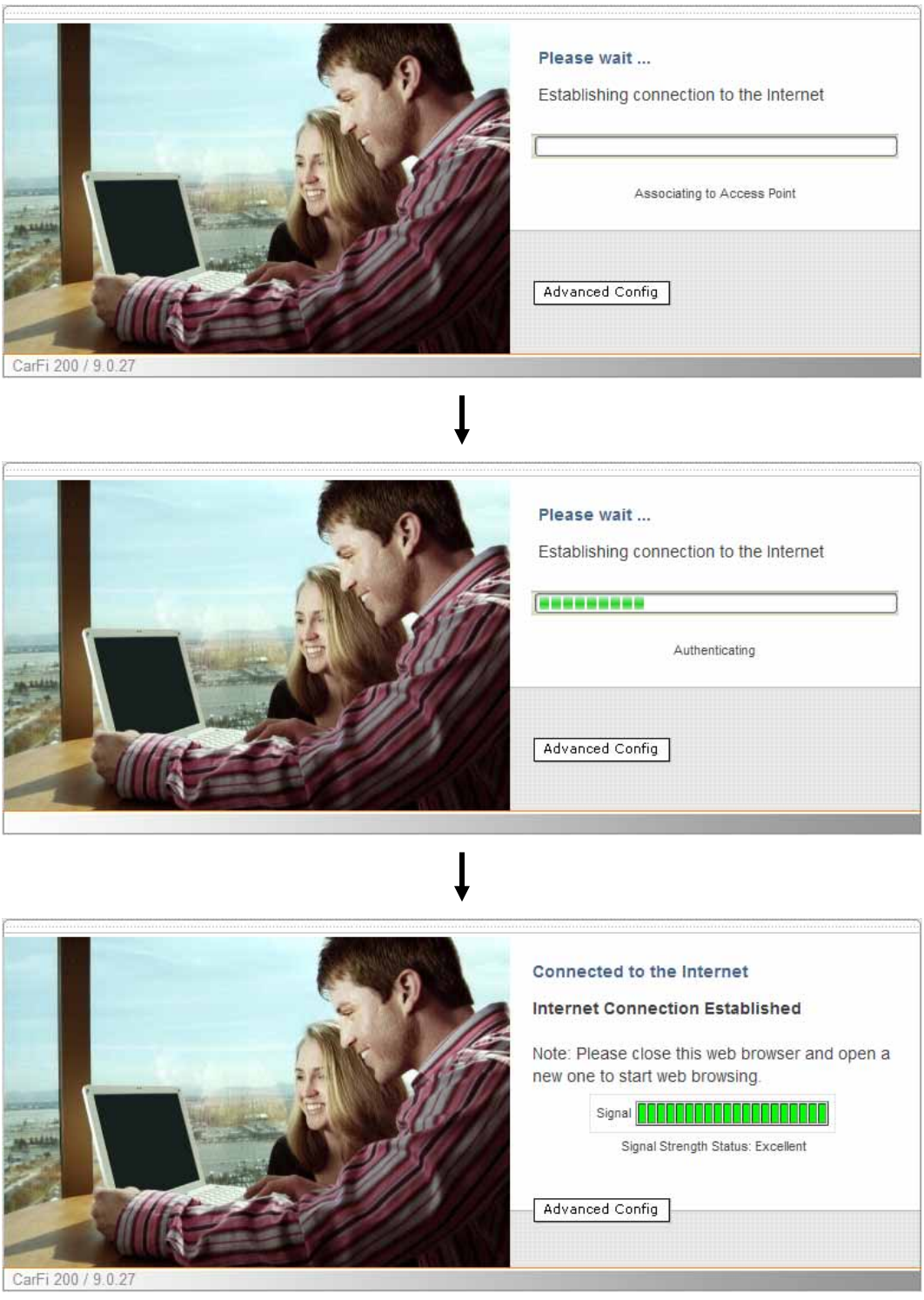


Illustration 3: Establishing Connection to the Internet

At this point, you are associated with the access point. You may now close the web browser and open a new one to start web browsing.

 Copyright © 2009 Pepwave

4.3 Settings Details

4.3.1 IP Settings

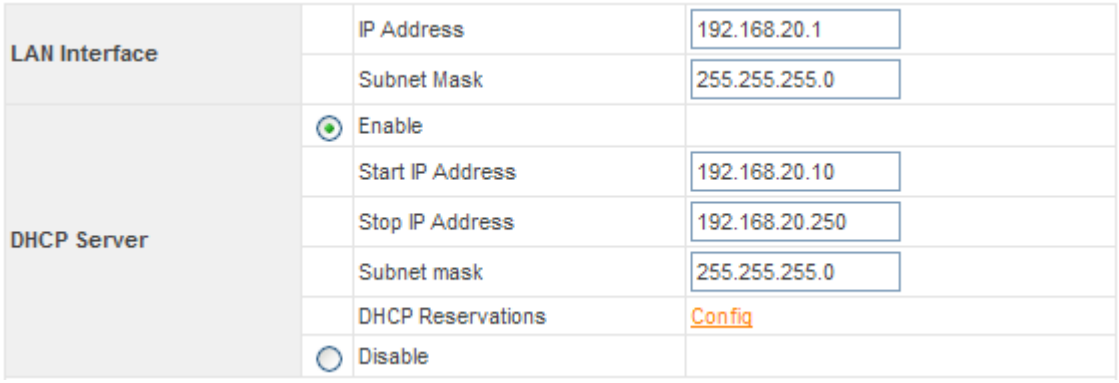


Illustration 5: IP Settings

IP Settings	
LAN Interface	To configure the LAN interface's IP address and subnet mask.
DHCP Server	To configure and enable the built-in DHCP server or not. If enabled, the IP address range can be configured. Press **Config** to configure DHCP Reservation if there is a need to assign a specific IP address to a specific MAC address using DHCP.

 Copyright © 2009 Pepwave

4.3.2 Wireless Settings

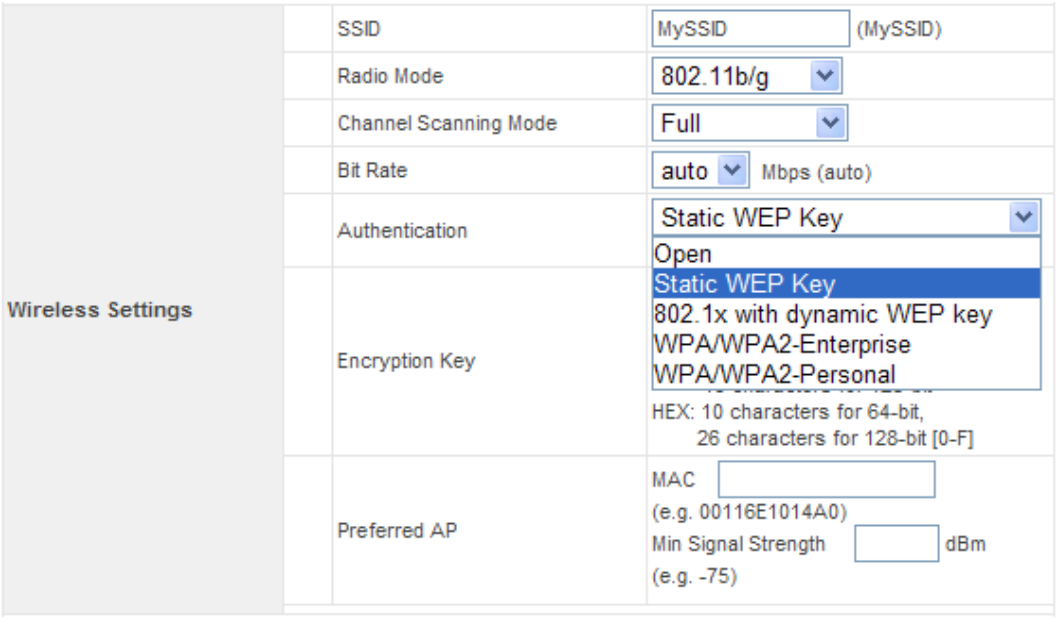


Illustration 4: Pepwave Wireless Settings

Wireless Settings	
SSID	To configure the SSID / ESSID / Network Name of the wireless network to associate to.
Radio Mode	It allows the user to choose between radio modulations support. E.g. 802.11b/g, 802.11g only, 802.11b, etc. The available settings depend on the Wi-Fi module installed on the device.
Bit Rate	To fix the 802.11 transmit bit rate. Available options depend on the Radio Mode chosen. If **auto** is chosen, the device will choose the best bit rate dynamically and automatically.
Authentication	Available options are ***Open, Static WEP Key, 802.1x with dynamic WEP key***, ***WPA/WPA2-Enterprise*** and ***WPA/WPA2-Personal***. The selection should be according to the setting of the access point you are associating to. Data transferred are encrypted under all modes except in Open mode. When Static WEP Key or WPA/WPA2-Personal is chosen, you should enter an encryption key in the Encryption Key field. You do not need to use 802.1x and WPA/WPA2-Enterprise unless instructed to do so by your ISP.
Preferred AP	The **MAC** address of a preferred access point can be entered here. When the preferred access point is found and its signal strength is higher than the **Min Signal Strength**, it will connect to this preferred access point, no matter the other access points are found even they have higher signal strength or the same SSID.

4.3.3 Roaming Settings

 Copyright © 2009 Pepwave

Illustration 5: CarFi Roaming Settings

Roaming Settings	
Roaming Settings	To configure and enable roaming among APs with the same SSID and authentication method.
Signal Level Threshold	If the signal level of connected AP falls below the specified value, the unit will attempt to roam to another AP with a better signal level.

 Copyright © 2009 Pepwave

4.3.4 Wireless IP Settings

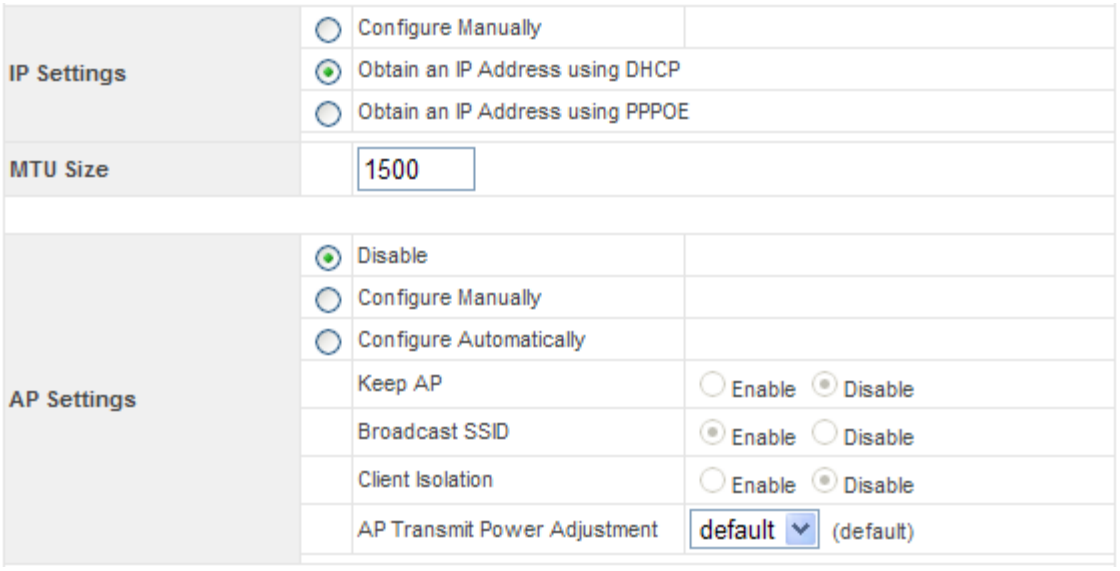


Illustration 6: Wireless IP Settings

Wireless IP Settings	
IP Settings	The IP address can be obtained automatically or configured manually. If you choose to manually configure the IP address for your unit, enter the fields **IP Address, Subnet Mask, Default Gateway, Preferred DNS Server** and **Alternate DNS Server**.
MTU Size	You may also set the MTU Size to increase the data packet size your unit can handle at one time.
AP Settings	The AP Settings will be covered in detail in the subsequent section **3.4 Integrated Wi-Fi Access Point Configuration**.

 Copyright © 2009 Pepwave

4.3.5 Restore and Reboot

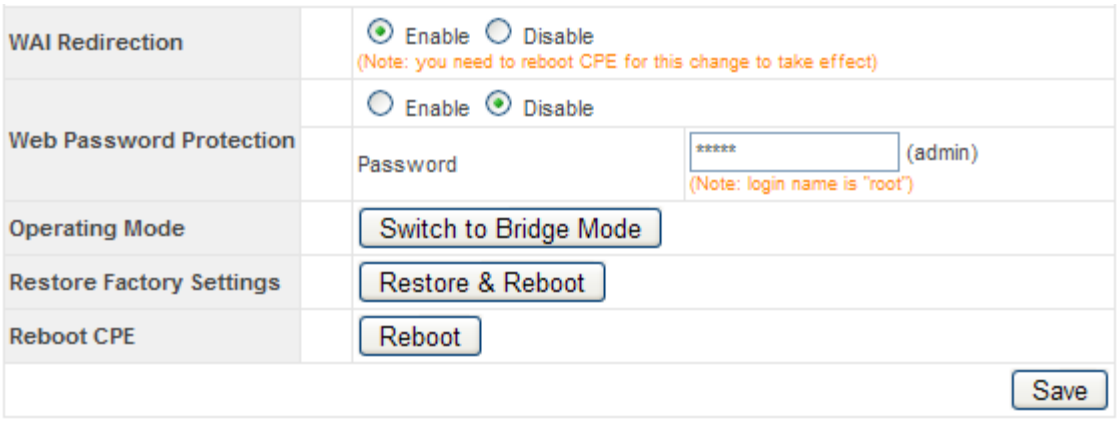


Illustration 7: Restore and Reboot

Restore and Reboot	
WAI Redirection	If the device is not connected to an access point, and the user is accessing an Internet web site, the settings control whether to redirect the web access to the web admin interface page or not. If this is disabled and the device is not connected, the browser will show a web access error message. The user can still access the web admin interface by accessing to the device's LAN IP address. By default, the LAN IP address is set as *http://192.168.20.1*.
Web Password Protection	Sets the password to protect the web user interface.
Operation Mode	Disable DHCP server and **Switch To Bridge Mode.**
Restore Factory Settings	To restore the device to default settings. When this option is clicked, default settings will be restored and the unit will be restarted.
Reboot CPE	Click to restart the device.

 Copyright © 2009 Pepwave

4.4 Integrated Wi-Fi Access Point Configuration

Integrated Wi-Fi Access Point is configured via the *CPE Setup* tab. The following sections will provide information as a guide through the configuration.

The available Access Point (AP) settings for the Integrated Wi-Fi Access Point functionality are as follows:

- **Disable**
  Integrated Wi-Fi Access Point functionality is disabled.
- **Configure Manually**
  Manual configuration of the SSID, Authentication, and Encryption Key values corresponding to the Access Point.
- **Configure Automatically**
  The SSID, Authentication, and Encryption Key values corresponding to the Access Point are automatically configured to be the same as the respective values that correspond to the ISP's network.

4.4.1 Access Point Disabled

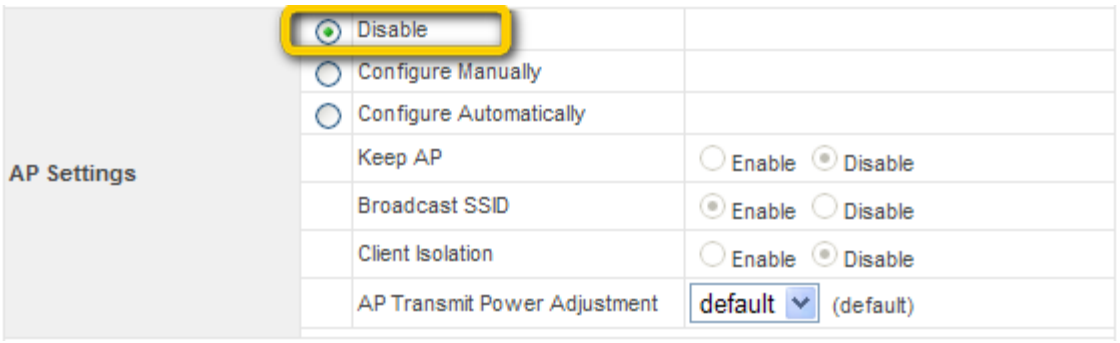


Illustration 8: Access Point Disabled

 Copyright © 2009 Pepwave

4.4.2 Access Point configure Manually

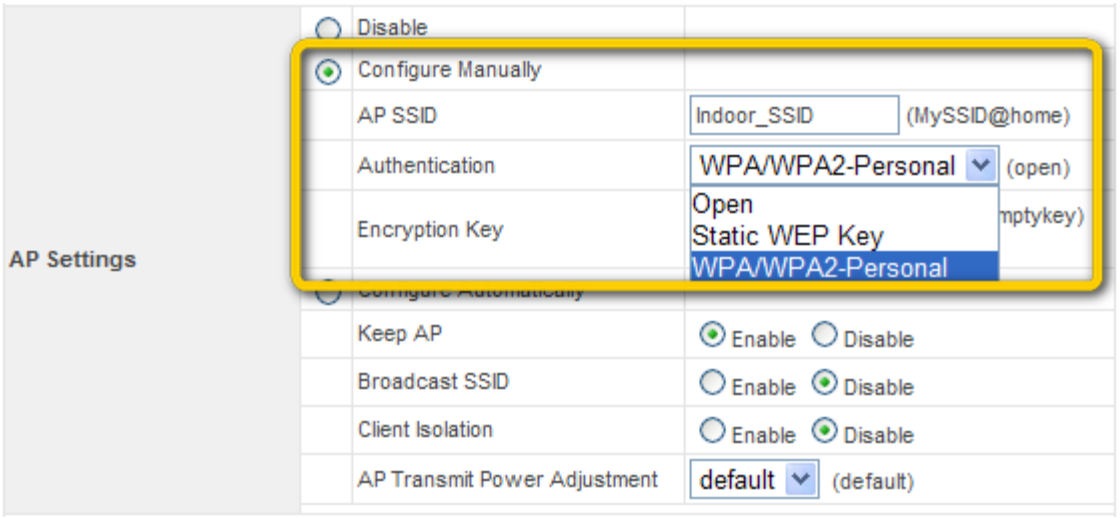


Illustration 9: Access Point Configure Manually

Configure Manually	
AP SSID	In Manual Configuration mode, the **SSID** is manually entered.
Authentication	It can be one of three configurable values: · **Open** No Encryption Key is necessary. · **Static WEP Key** A 64- or 128-bit Encryption Key is required, and can be entered in either an ASCII or HEX representation. · **WPA / WPA2-Personal** An Encryption Key, of at least 8 characters, is required.

 Copyright © 2009 Pepwave

4.4.3 Access Point Configure Automatically

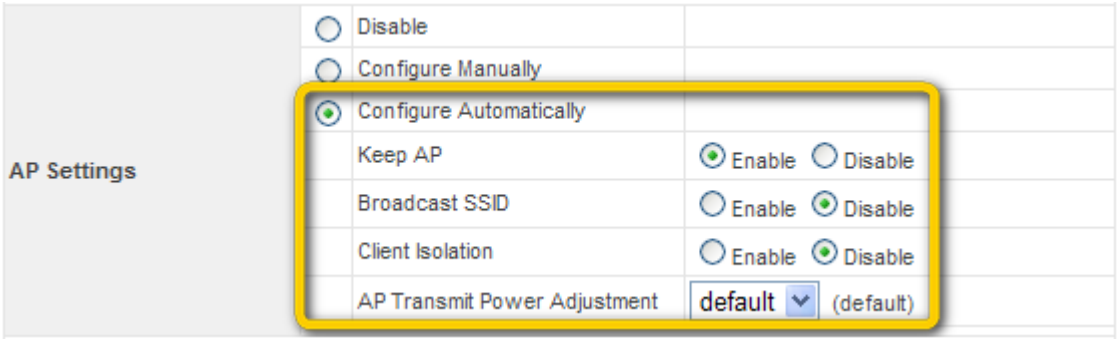


Illustration 10: Access Point Configure Automatically

Configure Automatically	
Keep AP	With this option enabled, the Wi-Fi Access Point will always on even if there is no connection to the mesh network.
Broadcast SSID	With this option enabled, the configured SSID will be broadcast such that it can be detected by an SSID scan. Otherwise, the configured SSID will not be broadcast such that it cannot be detected by an SSID scan. In order to connect with the access point, the SSID needs to be known by the client.
Client Isolation	Prevent wireless clients connected to the AP from communicating with each other.
AP Transmit Power Adjustment	An option to retain a lower power setting for indoor home devices. Available options are between -1 dBm and –15dBm.

With the Access Point Configuration set to **Configure Automatically**, the **SSID**, **Authentication**, and **Encryption Key** values of the Integrated Wi-Fi Access Point will be configured to be the same as in the ***4.3.2 Wireless Settings*** **section**.

This configuration mode is effectively equivalent to directly connecting 802.1b/g devices on the customers' premises with Citywide Wi-Fi.

Important Note
In the Wireless Settings section, if Authentication is set to either **802.1x with dynamic WEP key** or **WPA/WPA2-Enterprise**, then the Configure Automatically option of the Access Point Configuration becomes unavailable, because the Integrated Wi-Fi Access Point functionality currently does not support authentication via the 802.1x with dynamic WEP key and WPA/WPA2-Enterprise methods.

 Copyright © 2009 Pepwave

4.5 Test the Setup

To test to setup, you can now go to the unit's main page, enter the user name and password. The realm (the text box next to the "@" sign) value can be left empty. Then click the Connect button.

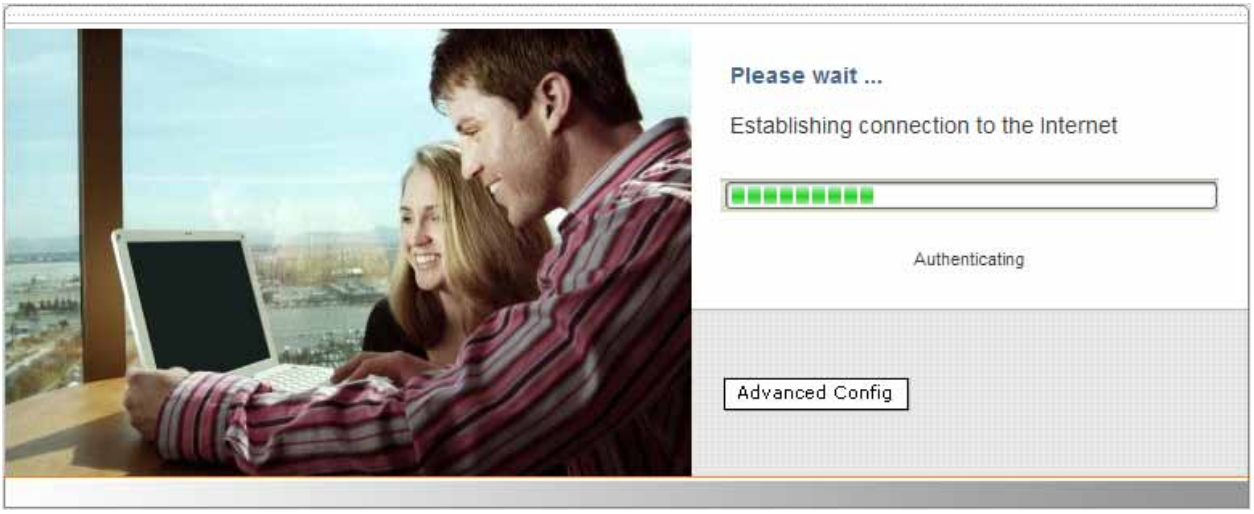


Illustration 11: Establishing Connection to the Internet

After connected, you should see:

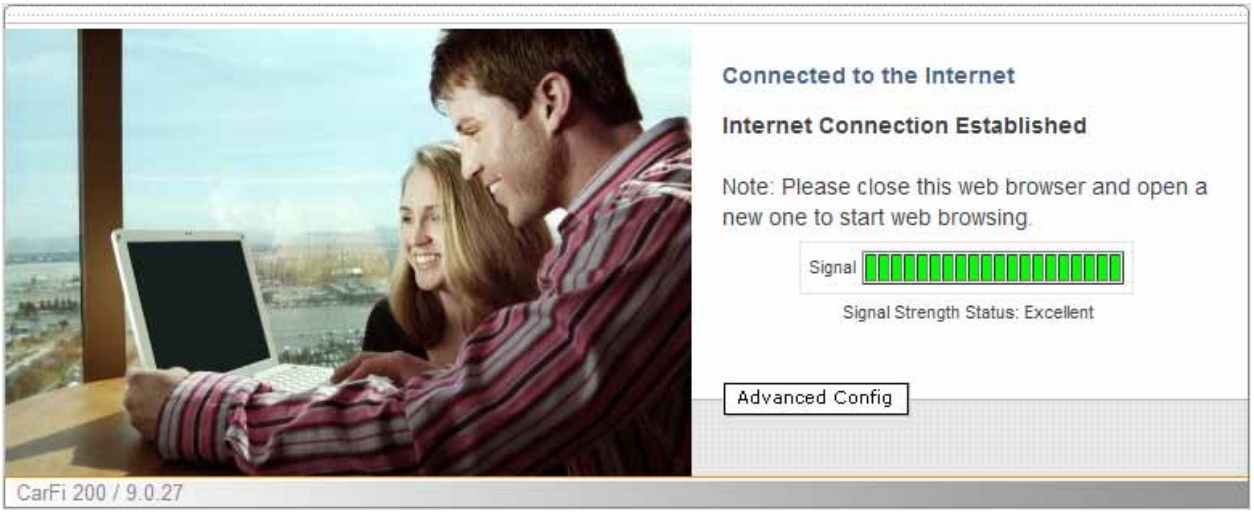

Connected to the Internet
Internet Connection Established
Note: Please close this web browser and open a new one to start web browsing.
Signal
Signal Strength Status: Excellent
Advanced Config
CarFi 200 / 9.0.27

Illustration 12: Internet Connection Established

 Copyright © 2009 Pepwave

4.6 Port Forwarding

Port Forwarding Settings	
Service Port Range	Enter a port or a range of ports that would like to forward.
Protocol	The Protocol for the above port(s) forwarding. You should select at least one protocol between **TCP** and **UDP**.
IP Address	The IP address that you would like the traffics forwarded to.
Del	By clicking the button, you can delete the corresponding rows of port forwarding rules.

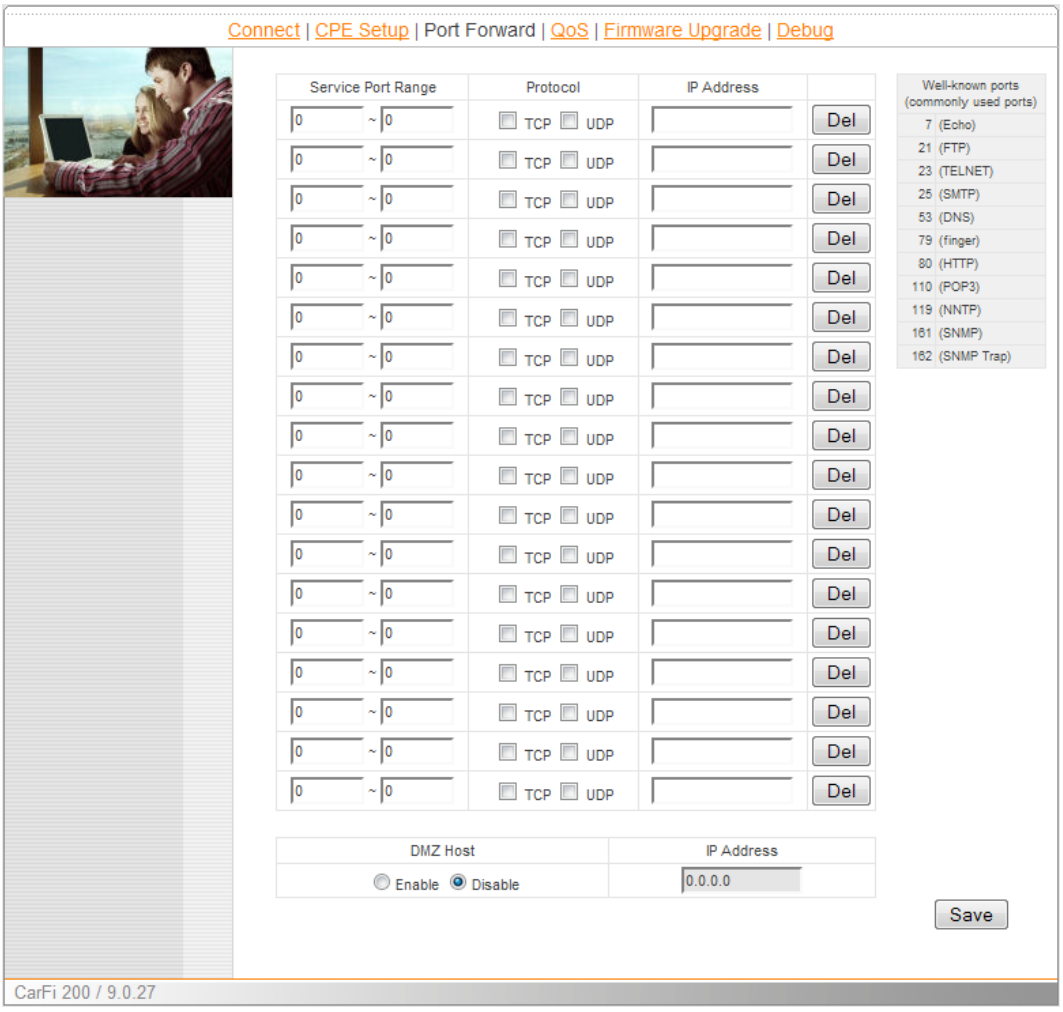


Illustration 13: Port Forwarding Settings

 Copyright © 2009 Pepwave

Below the port forwarding table is an option called **DMZ Host**. If you **Enable** this function, your Pepwave Surf will become a DMZ device. You can enter an IP address, which will be the IP address of the device that expose to the Internet. The purpose of a DMZ is to make all external users can has access to any ports of the device, so that user do not need to set up port forwarding and internet traffics can directly reach internal devices.

Tip

Below is a table showing some well-known ports, which is officially registered with IANA.

Port Number	Description	Protocol
7	Echo	TCP, UDP
21	FTP	TCP
23	TELNET	TCP
25	SMTP	TCP, UDP
53	DNS	TCP, UDP
79	Finger	TCP
80	HTTP	TCP, UDP
110	POP3	TCP
119	NNTP	TCP
161	SNMP	TCP, UDP
162	SNMP Trap	TCP, UDP

Copyright © 2009 Pepwave

4.7 QoS

QoS Settings	
Target	To choose whether it is an incoming (Source) or outgoing (Destination) traffic that should be controlled by the service.
Service Port Range	Enter a port or a range of ports that would like to be controlled by the service.
Protocol	The Protocol for the above port(s). You should select at least one protocol between TCP and UDP.
IP Address	The IP address that you would like the traffics to be controlled by the service.
Priority	There are three choices for service priority: Background, Video and Voice. By choosing Default, priority will be automatically adjusted.
Del	By clicking the button, you can delete the corresponding rows of port forwarding rules.

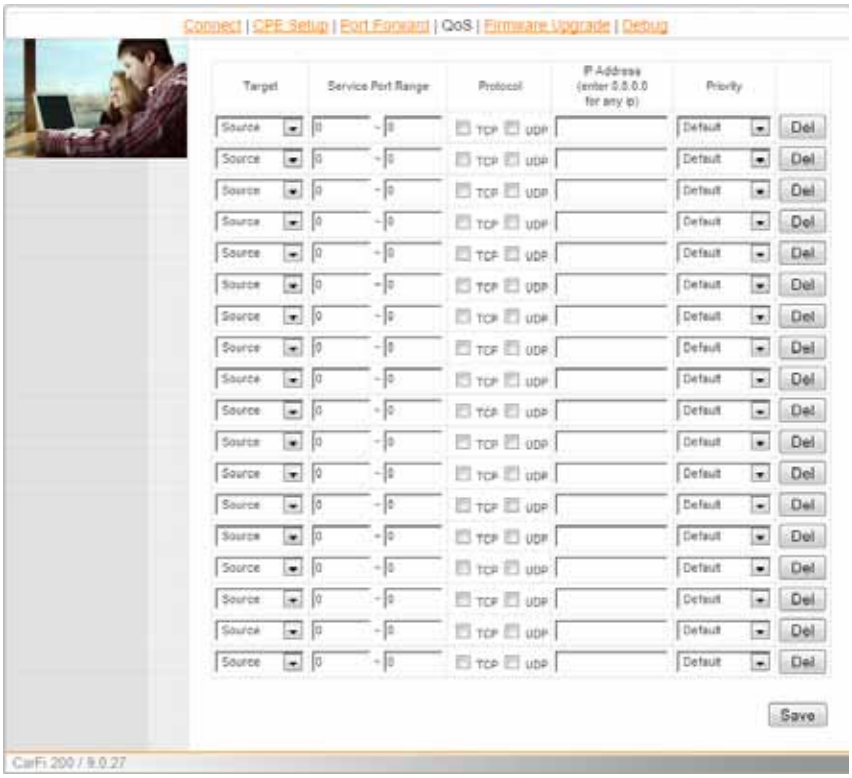


Illustration 14: QoS Settings

 Copyright © 2009 Pepwave

4.8 Firmware Upgrade

The Pepwave devices are able to check whether a newer firmware (the software running on the unit) is available.

However, it is recommended that you do not update the firmware unless specifically instructed by your ISP to do so. When a firmware upgrade is needed, your ISP will either give you instructions or upgrade the firmware remotely.

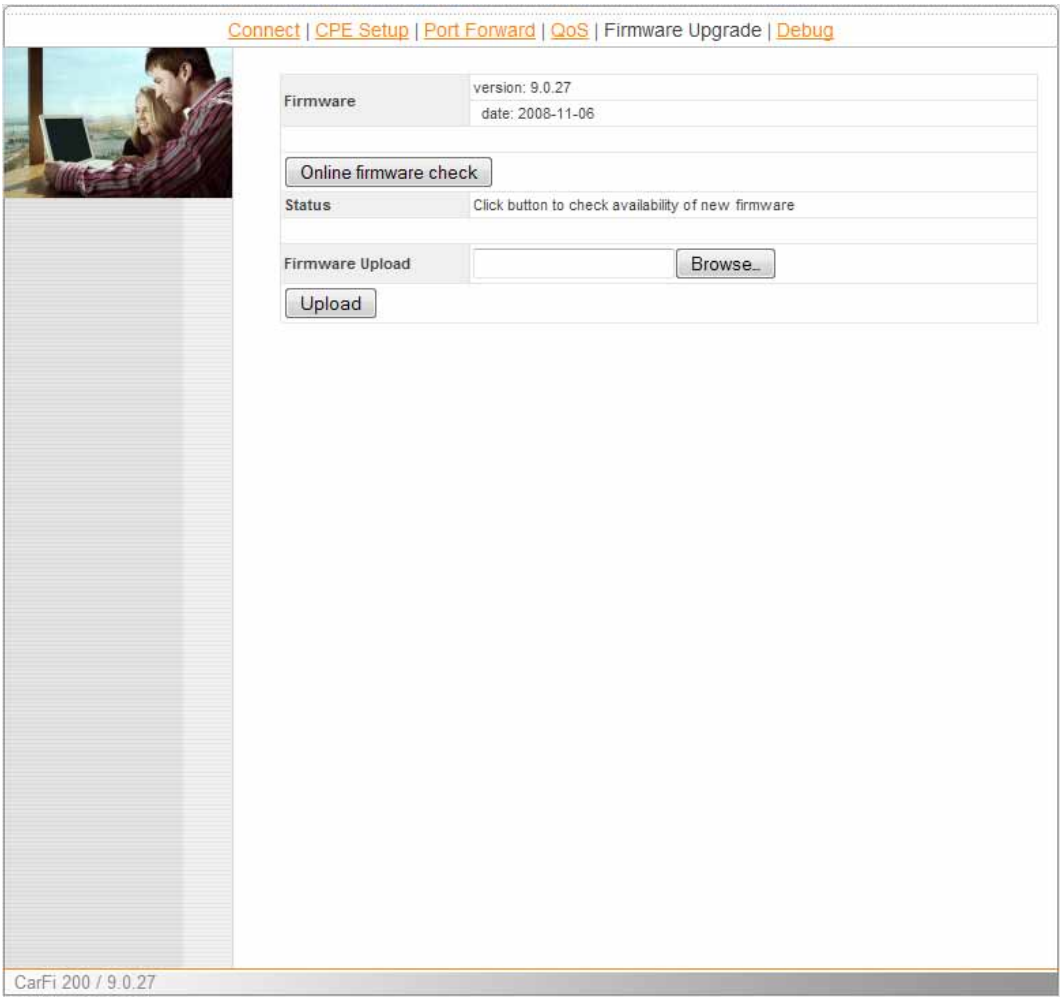


Illustration 15: Firmware tab showing the system information

Tip

It is highly recommended users to download the configuration file (download directory can be found in the next section) for backup propose before doing firmware upgrade.

 Copyright © 2009 Pepwave

4.9 Debug and System information

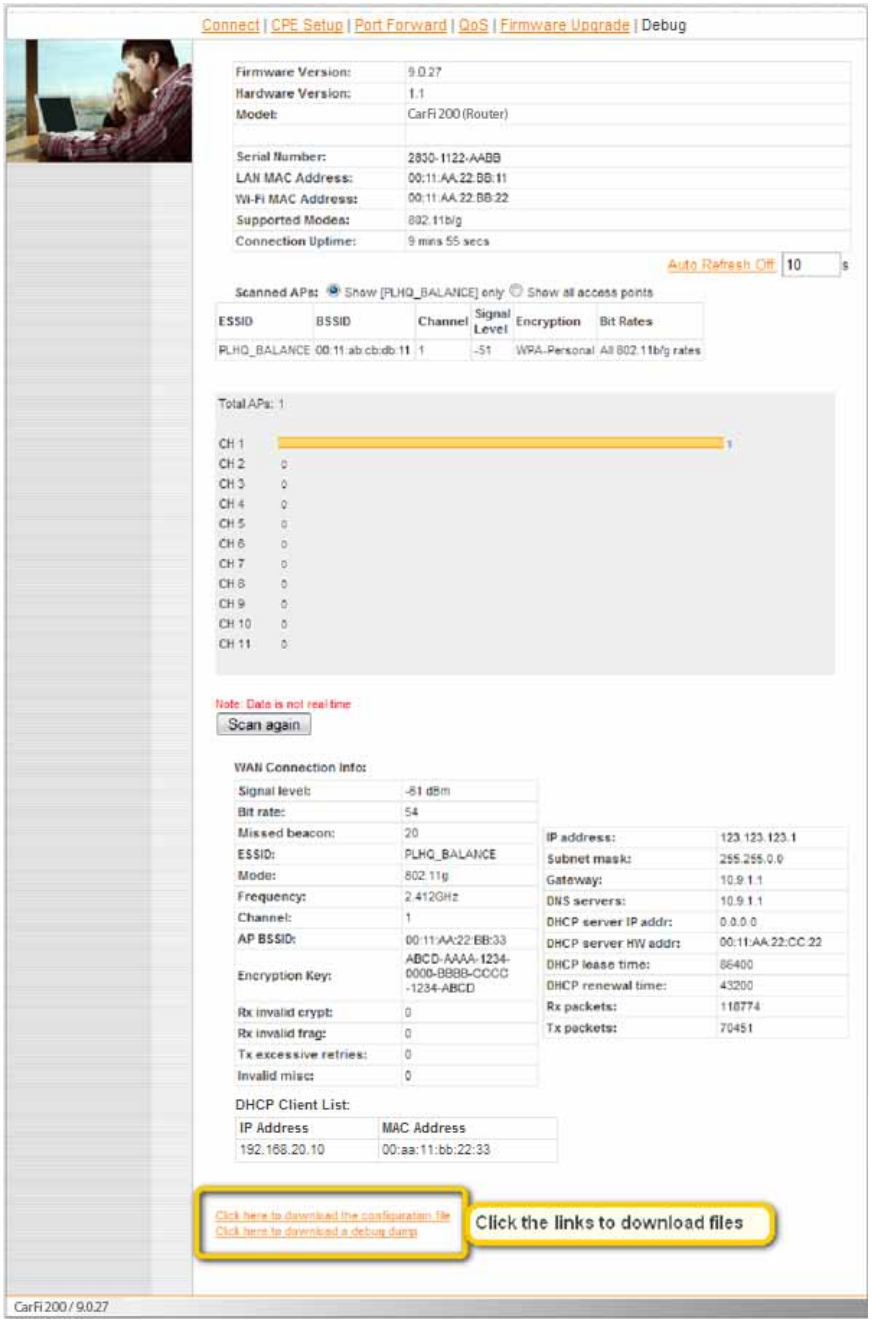


Illustration 16: Debug tab showing the system information

Tip

Debug dump and **configuration file** can be downloaded through clicking the links illustrated above. If you encounter issues and would like to contact Pepwave Support Team (email: support@pepwave.com), please download the above files and attach it along with a description of your encountered issue.

 Copyright © 2009 Pepwave

4.10 Restore to Default Settings

There are two ways to restore the Pepwave CarFi unit to default settings.

If you are able to access the web admin interface, go to the *CPE Setup* page, and click the **Restore and Reboot** button.

Otherwise, you can also power up the unit and wait for about 1 min. Then push the **Reset** Button at the rear side of the unit using a pin and then hold it for 5 seconds. The unit will restore the settings to factory default and reboot.

 Copyright © 2009 Pepwave

Appendix:

Federal Communication Commission Interference Statement

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one of the following measures:

1) Reorient or relocate the receiving antenna.
2) Increase the separation between the equipment and receiver.
3) Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
4) Consult the dealer or an experienced radio/TV technician for help.

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

FCC Caution: Any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate this equipment.

IMPORTANT NOTE

FCC Radiation Exposure Statement

This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with minimum distance 20cm between the radiator & your body.

This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.

 Copyright © 2009 Pepwave

PEPWAVE

Broadband Possibilities

www.pepwave.com

Contact Us:

Sales
sales@pepwave.com

Support
support@pepwave.com

Business Development and Partnerships
partners@pepwave.com

Address:

United States Office
800 West El Camino Real,
Mountain View
CA 94040
United States
Tel: +1 (650) 331 0641
Fax: +1 (650) 625 4664

Hong Kong Office
17/F, Park Building,
476 Castle Peak Road
Cheung Sha Wan
Hong Kong
Tel: +852 2990 7600
Fax: +852 3007 0588